

What is claimed:

5 **Claim 1.** (currently amended) A restraint system equipped with a shoulder holder to increase survival chance in an real-world accident of a vehicle, train or an aeroplane or during in an  
inflight turbulence-related vibrations of an aeroplane, comprising  
a seat belt (1d, 1e), consisting of several belt shoulder-portions, at least one latch plate, a  
buckle assembly, a belt pretensioner and belt fittings;  
a shoulder holder (10d), having a pair of shoulder caps (10.2d), which, when in a resting  
position, are located in a seat backrest (3.2d, 3.2e); and  
10 a manually-operated rotatable device (28), having a pair of the rotatable levers (28.5),  
retained by the stop pieces (28.9) in the resting position, where the rotatable levers (28.5),  
the having first ends, of which is connected to the pair of shoulder caps (10.2d), and the  
other second ends of which, connected to each other by a shaft (28.7), are rotatably  
attached to a pair of casings (29), each of which, defined by an L-shaped plate (28.4) and  
15 two outer tubes (28.1, 28.2), connected to each other by a coupling wall (28.3), is height-  
adjustable, latchable and guided by the inner tubes (71, 72) of a seat backrest frame (3.4d,  
3.4e);

wherein

20 the body of a passenger is restrained by the seat belt (1d, 1e) and in the operating position  
the his shoulders are restrained by the shoulder caps (10.2d), moved by the rotatable  
device, manually-operated, from the resting position to an operative position;  
where at least one belt-shoulder belt portion of the seat belt (1d, 1e) is extended over at least  
one of the respective shoulder caps and over at least one a of the U-shaped plates (10.15)  
thereof, when the rotatable levers (28.5) are manually rotated, causing the release cams  
25 (28.6) of the rotatable levers (28.5) are manually rotated, causing the release cams  
by the first springs (28.10), thereby permitting the locking pins (28.12), pre-loaded by the  
second springs (28.13), and loosely guided in the guide tubes (28.11), to move into the  
holes (28.14) of the casings (29) and block the rotatable levers in both directions.

30 **Claim 2.** (currently amended) A restraint system equipped with a shoulder holder to increase survival chance in an real-world accident of a vehicle, train or an aeroplane or in an inflight  
during turbulence-related vibrations of an aeroplane, comprising  
a seat belt (1, 1e), consisting of several belt shoulder-portions, at least one latch plate, a  
buckle assembly, a belt pretensioner and belt fittings;  
a shoulder holder (10e), having a pair of shoulder caps (10.2e), which, when in a resting  
35 position, are located on an upper portion of a seat backrest (3.2d, 3.2e); and  
a motor-driven rotatable device (28a), having a drive apparatus (80) and a pair of the  
rotatable levers (28.5a), having the first ends of which is, connected to the pair of  
shoulder caps (10.2e), and the other second ends of which, connected to each other by a  
shaft (28.7), are rotatably attached to a pair of casings (29a), each of which, defined by an  
40 L-shaped, partly laterally closed and partly laterally open plate (28.4a) and two outer  
tubes (41e, 41f), connected to each other by a coupling wall (28.3), is height adjustable,  
latchable and guided by the inner tubes (71, 72) of a seat backrest frame (3.4d, 3.4e); and  
vibration-dampening energy absorbers (40e, 40f), having a number of clamping elements  
(42e, 42f) provided with sites of predetermined fracture (s), biased, arranged along the  
outer tubes (41e, 41f) and tautly, less tautly and/or loosely connected to the pair of  
45 rotatable levers via the stop pieces (28.9a) by the corresponding wires (47e, 47f);

wherein

the body of a passenger is restrained by the seat belt (1, 1e) and in the operating position the his shoulders are restrained by the shoulder caps (10.2e), moved by the rotatable device, driven by the drive apparatus (80), from the resting position to an operative position; where at least one ~~belt-shoulder belt~~ portion of the seat belt (1, 1e) is extended over at least one of the respective shoulder caps and over at least one of the U-shaped plates (10.15) thereof, when the rotatable levers (28.5a) are rotated by a ~~the~~ drive apparatus (80), causing the release cams (28.6a) of the rotatable levers to force the a rotation of the lock pawls (28.8a), pre-loaded by the first springs (28.10a), thereby permitting the locking pins (28.12), pre-loaded by the second springs (28.13); and loosely guided in the guide tubes (28.11), to move into the holes (28.14) of the casings (29a) and block the rotatable levers in one direction;

where in the real-world accident or in the inflight a turbulence the a forward motion of the torso and head rotates the rotatable levers in the another direction through the openings of the L-shaped, partly laterally closed and partly laterally plates (28.4a), thus moving the clamping elements (42e, 42f) along the corresponding tubes (41e, 41f) resulting in the a work of deformation and friction, during which vibrations are dampened and the a stored energy is released by fracture of the sites of predetermined fracture of the clamping elements in excess of the respective threshold values.

Claim 3. (currently amended) A restraint system equipped with a shoulder holder to increase survival chance in an real-world accident of a vehicle, train or an aeroplane or in an inflight during turbulence-related vibrations of an aeroplane, comprising

a seat belt (1, 1b, 1e), consisting of several belt portions, at least one latch plate, a buckle assembly, a belt pretensioner and belt fittings;

a shoulder holder (10, 10b, 10f), having a pair of shoulder caps (10.2, 10.2b, 10.2f) with open apertures to receive the belt portions in the operating position;

a pair of latch plates (10.1b), connected to the shoulder caps (10.2, 10.2b, 10.2f), with open apertures, in which the belt portions are loosely secured by the quick-release pins (10.10) in the operating position, when the shoulder holder and the seat belt are fitted together, and released by withdrawal thereof for removal in the resting position, when the shoulder holder is withdrawn; and

at least one pair of buckle assemblies (18a / 19a to 18n / 19n), attached in a seat backrest (3.2a, 3.2c);

wherein

the body of a passenger is restrained by the seat belt (1, 1b, 1e) and in the operating position the his shoulders are restrained by the shoulder caps (10.2, 10.2b, 10.2f) upon plug-in connection of the latch plates (10.1b) with the buckle assemblies (18a / 19a to 18n / 19n); and

at least one belt-shoulder belt portion of the seat belt (1, 1b, 1e) is extended over at least one of the open apertures of the corresponding shoulder caps and loosely secured in at least one of the open apertures of the latch plates.

Claim 4. (currently amended) A restraint system equipped with a shoulder- and neck holder to increase survival chance in an real-world accident of a vehicle, train or an aeroplane or during in an inflight turbulence-related vibrations of an aeroplane, comprising

a seat belt (1a, 1c, 1e), consisting of several belt portions, at least one latch plate, a buckle assembly, a belt pretensioner and belt fittings;

a one-piece shoulder- and neck holder (10a, 10c), defined by a neck cap (10.4a, 10.4c) and a shoulder cap (10.2a, 10.2c) with open apertures to receive the belt portions in the operating position;

5 a pair of latch plates (10.1b), connected to the shoulder cap (10.2a, 10.2c), with open apertures, in which the belt portions are loosely secured by the quick-release pins (10.10) ~~in the operating position, when the one-piece shoulder- and neck holder and the seat belt are fitted together, and released by withdrawal thereof for removal in the resting position, when the one-piece shoulder- and neck holder is withdrawn;~~ and

10 at least one pair of buckle assemblies (18a / 19a to 18n / 19n), attached in a seat backrest (3.2a, 3.2c);

wherein

15 the body of a passenger is restrained by the seat belt (1a, 1c, 1e) and ~~in the operating position the pair of his shoulders and the his neck~~ are restrained by the shoulder cap (10.2a, 10.2c) and neck cap (10.4a, 10.4c) upon plug-in connection of the latch plates (10.1b) with the buckle assemblies (18a / 19a to 18n / 19n); and

at least one belt shoulder portion of the seat belt (1a, 1c, 1e) is extended over at least one of the corresponding open apertures of the shoulder cap and loosely secured in at least one of the open apertures of the respective latch plates.

20 Claim-5. (currently amended) TheA restraint system according to claim 2, wherein the shoulder cap (10.2e), recessed about a supporting tube (3.61) of a head rest (3.6), is reinforced by a reinforcing plate (10.13).

25 Claim-6. (currently amended) TheA restraint system equipped with a shoulder- and neck holder according to claim 2, further comprising a neck holder, having a pair of neck caps (10.4, 10.4b), rigidly attached to the pair of shoulder caps (10.2e), to restrain the passenger's neck in the operativeoperating position.

Claim-7. (currently amended) TheA restraint system according to claim 6 wherein the drive apparatus (80) is activated by a separately operated switch.

Claim-8. (currently amended) TheA restraint system according to claim 6, wherein the drive apparatus is activated by a controller, monitoring the speed, in excess of a threshold speed.

30 Claim-9. (currently amended) TheA restraint system according to claim 6, wherein the drive apparatus is activated by an accelerator pedal.

35 Claim-10. (currently amended) TheA restraint system according to claim 6, wherein the drive apparatus is activated when a sensor senses an accident of a vehicle, train or an aeroplane or turbulence-related vibrations of an aeroplane acceleration, which exceeds a threshold acceleration.

Claim-11. (currently amended) TheA restraint system according to claim 6, wherein upon the a pressure on a release button (87a to 87c) of the seat the drive apparatus (80) moves the shoulder- and neck holder back from the operativeoperating position to the resting position.

40 Claim-12. (currently amended) TheA restraint system according to claim 6, wherein upon the pressure on a master release button (84) of the lap buckle assembly (9.1) all latch plates of the seat belt are disengaged from the buckle assemblies and the drive apparatus (80) moves the shoulder- and neck holder back from the operating position to the resting position the lap buckle assembly (9.1) has a master release button (84), which is connected to switches of the drive apparatus (80) and electrical motors (4.2b) of the remaining buckle assemblies of the

seat belt via respective deactivating cables, where the master release button (84), when depressed, disengages all the latch plates and moves the shoulder- and neck holder back from the operative position to the resting position.

5      ~~Claim-13.~~ (currently amended) TheA restraint system equipped with a shoulder- and neck holder according to claim 3, further comprising  
a neck holder, having a pair of neck caps (10.4, 10.4b), insertably attached to the pair of  
shoulder caps (10.2, 10.2b, 10.2f), to restrain the neck ~~in the operating position upon use,~~  
and detachable therefrom for removal  
10      where the neck caps can be detached therefrom and removed.

10      ~~Claim-14.~~ (currently amended) TheA restraint system according to claim 13, wherein the shoulder- and neck holder (10, 10b, 10f) is provided with at least one energy absorber (10.3, 10.3a, 10.5, 10.5a, 10.5c).

15      ~~Claim-15.~~ (currently amended) TheA restraint system according to claim 14, wherein the energy absorber is fastened to the cap by an adhesive fastener and detachable therefrom by opening the fastener.

15      ~~Claim-16.~~ (currently amended) TheA restraint system according to claim 3, wherein the shoulder cap is shoulder-shaped.

15      ~~Claim-17.~~ (currently amended) TheA restraint system according to claim 14, wherein the energy absorber is shoulder-shaped.

20      ~~Claim-18.~~ (currently amended) TheA restraint system according to claim 13, wherein the neck cap is neck-shaped.

20      ~~Claim-19.~~ (currently amended) TheA restraint system according to claim 14, wherein the energy absorber is neck-shaped.

25      ~~Claim-20.~~ (currently amended) TheA restraint system according to claim 19, wherein the energy absorber (10.5a), arranged in the neck cap (10.4a), serves as a neck collar having a wide portion for the chin.

25      ~~Claim-21.~~ (currently amended) TheA restraint system according to claim 3, wherein the latch plate of the holder is provided with an energy absorber (10.9).

30      ~~Claim-22.~~ (currently amended) TheA restraint system according to claim 13, wherein the shoulder- and neck cap, provided with a flange (10.12), is adjustable in height by rotating a bolt (10.7) in a threaded hole of a ~~the~~ flange (10.12).

30      ~~Claim-23.~~ (currently amended) TheA restraint system according to claim 13, wherein the shoulder- and neck cap, provided with a flange (10.12f), is adjustable in width by rotating a bolt (10.6a) in a threaded hole of a ~~the~~ flange (10.12f).

35      ~~Claim-24.~~ (currently amended) TheA restraint system equipped with a ~~the~~ shoulder- and neck holder and with vibration-dampening energy absorbers ~~to absorb great energy and damp strong vibration~~ according to claim 13, further comprising at least one vibration-dampening energy absorber (30, 40, 50), which consists of  
40      a retaining element (31, 41, 51), fastened to serving as a member of a seat frame, generally representing a seat-cushion- or seat backrest frame, and

at least one clamping element (32, 32.1 to 32.n, 42, 42.1 to 42.n, 52, 52.1 to 52.n), connected to the buckle assembly of the seat by means of at least one control-wire (37, 47, 57), biased, arranged along the retaining element and provided with sites of predetermined fracture (s), which have at least one threshold value.

5     **Claim-25.** (currently amended) TheA restraint system according to claim 24, wherein the retaining element is integral part of integrated into the seat backrest-frame.

**Claim-26.** (currently amended) TheA restraint system according to claim 24, wherein the clamping element has open and tube-shaped profile.

10    **Claim-27.** (currently amended) TheA restraint system according to claim 24, wherein the retaining element is tube-shaped.

**Claim-28.** (currently amended) TheA restraint system according to claim 24, wherein a longitudinal rib (41.1, 51.1) is arranged to the retaining element.

15    **Claim-29.** (currently amended) TheA restraint system according to claim 28, wherein both edges of the clamping element are loosely guided by the longitudinal rib in longitudinal direction.

**Claim-30.** (currently amended) TheA restraint system according to claim 28, wherein a stop element (41.3) is arranged to the longitudinal rib.

20    **Claim-31.** (currently amended) TheA restraint system according to claim 28, wherein the thickness of the longitudinal rib increases in longitudinal direction of the movement of the clamping element, in which the clamping element moves.

**Claim-32.** (currently amended) TheA restraint system according to claim 24, wherein the clamping element is cone-shaped.

**Claim-33.** (currently amended) TheA restraint system according to claim 24, wherein the retaining element (51) is cone-shaped.

25    **Claim-34.** (currently amended) TheA restraint system according to claim 24, wherein at least one stop pin (46, 46.1 to 46.n) is laterally arranged to the retaining element, where the stop pin blocks the a movement of the clamping element, thus resulting in fracture of the sites of predetermined fracture.

30    **Claim-35.** (currently amended) TheA restraint system according to claim 24, wherein the contact surfaces of the retaining element have arbitrary friction coefficients ( $\mu_0$ ).

**Claim-36.** (currently amended) TheA restraint system according to claim 24, wherein the contact surfaces of the retaining element are provided with a soundproofing material (83).

**Claim-37.** (currently amended) TheA restraint system according to claim 24, wherein the contact surfaces of the clamping element have arbitrary friction coefficients ( $\mu_0$ ).

35    **Claim-38.** (currently amended) TheA restraint system according to claim 24, wherein the contact surfaces of the clamping element are provided with a soundproofing material (83).

40    **Claim-39.** (currently amended) TheA restraint system according to claim 29, wherein the end portions of a complementary wires (37a1), connected to the a-control-wire (37), are inserted into both cylinder-shaped edges (37c1) of the clamping elements (32) and secured by clamping the cylinder-shaped edges (37c1).

Claim 40. (currently amended) TheA restraint system according to claim 24, wherein the clamping element is provided with a pair of ribs, whereto several pairs of adjusting holes (L<sub>1</sub> to L<sub>e</sub>) are arranged.

5 Claim 41. (currently amended) TheA restraint system according to claim 24, wherein a set of vibration-dampening energy absorbers comprises the retaining element, at least one stop pin, at least one stop element, one control-clamping element, connected to a-the control-wire, and complementary clamping elements with/without sites of predetermined fracture, where all clamping elements, arranged along the retaining element, are tautly, less tautly and/or loosely connected to each other by means of complementary wires.

10 Claim 42. (currently amended) An energy-absorbing, vibration-dampening device ~~restraint-system~~ according to claim 41, wherein ~~an energy-absorbing device comprises comprising~~ a couple member (1.2a, 1.2b) and the sets of vibration-dampening energy absorbers, the control-wires of which are tautly, less tautly and/or loosely connected to the couple member.

15 Claim 43. (currently amended) TheA restraint system according to claim 42, wherein a guide piece (4.7a), fastened to the seat frame, has  
a pair of engaging parts (4.10a), form-locking connected to the corresponding apertures of a housing (4.8a) of the buckle assembly; and  
a recess (4.5a) to loosely guide a tie band (1.1a), ~~one end of which is connected to the buckle assembly and the other end to the couple member~~ having a first and second end connected to the buckle assembly and the couple member.

20 Claim 44. (currently amended) TheA restraint system according to claim 42, wherein a guide piece (4.7b), fastened to the seat frame, has  
a pair of engaging parts (4.10b), form-locking connected to the corresponding apertures of a housing (4.8b) of the buckle assembly; and  
25 a longitudinal groove (4.5b) to loosely guide a tie band (1.1b), ~~one end of which is connected to the buckle assembly and the other end to the couple member~~ having a first and second end connected to the buckle assembly and the couple member.

30 Claim 45. (currently amended) TheA restraint system according to claim 42, wherein a housing (4.8c), movable along a pair of tubes (27.3) of the seat backrest frame and latchable thereon, has  
an aperture to receive an engaging part (4.10c) of the buckle assembly, through a hole (2.3) of which a wire is protruded and both end portions of the wire, serving as tie bands, are secured by a mutual bracket (1.7); and  
two holes (4.5c) to loosely guide the tie bands, connected to the couple members.

35 Claim 46. (currently amended) An anti-submarining seat-belt assembly ~~TheA~~ restraint-system to absorb energy and dampen vibrations in the real-world accident, a submarining, a rollover or the turbulence-related vibrations according to claim 42, wherein ~~at least one latch plate (11, 25), slideable along the lap belt portion, is in plug-in connected to the buckle assembly (7, 8), equipped with the energy-absorbing device, of the seat cushion, to restrain both thighs of the passenger and absorb energy and damp vibrations in the event of submarining, rollover or turbulence-related vibrations~~ the lap belt portion (1.3) of the seat belt (1d, 1e), provided with at least one movable anti-submarining latch plate (11, 25), is subdivided into two anti-submarining belt portions;  
40 which restrain both thighs of the passenger upon plug-in connection of the movable anti-  
45 submarining latch plate (11, 25) with one of anti-submarining buckle assemblies (7, 8, 8a)

of a seat cushion, whose frame is equipped with the guide pieces (4.7a) and the energy-absorbing, vibration-dampening device;  
where release cables (4.2) connect release buttons of the submarining buckle assemblies to a common release button (84o), located on the seat cushion, which, when depressed,  
5 disengages the movable anti-submarining latch plate (11, 25) while the restraint of the belted passenger remains unaffected.

Claim-47. (currently amended) ~~The~~A restraint system according to claim 13, wherein ~~upon the pressure on a master release button (84) of the lap buckle assembly (9.1) all latch plates of the seat belt and holder are disengaged~~ the lap buckle assembly (9.1) has a master release  
10 button (84);

~~which is connected to release buttons of the remaining buckle assemblies of the seat belt and to release buttons of the pairs of buckle assemblies, to one of which the latch plates of the holder are plug-in connected;~~

~~where the master release button (84), when depressed, disengages all the latch plates of the holder and seat belt.~~

Claim-48. (currently amended) ~~The~~A restraint system according to claim 3, wherein the shoulder holder is ~~fastened-attached~~ to the seat for the purpose of storage and detachable therefrom ~~upon the pressure on by depressing a release button (87a to 87c) of the seat.~~

Claim-49. (currently amended) ~~The~~A restraint system according to claim 13, wherein the shoulder- and neck holder is ~~fastened-attached~~ to the seat for the purpose of storage and detachable therefrom ~~upon the pressure on by depressing a release button of the seat.~~

Claim-50. (currently amended) ~~A restraint system~~ An energy-absorbing, vibration-dampening safety seat according to claim 49, wherein a detachable front portion of the seat cushion (3.1a) serves as a shoulder- and neck holder (10a), the latch plates of which are plug-in connected to the seat backrest, to restrain the shoulders and neck of a belted child and the space thereof is exploited to accommodate the legs of the child sitting on the rear portion thereof, thus integrating the seat belt, holder and seat into an energy-absorbing child-seat.  
25 sets of vibration-dampening energy absorbers, the seat belt, holder and seat are integrated into a safety adult-seat;

which is transformed into a safety child-seat when a detachable front portion of the seat cushion (3.1a) serves as a shoulder- and neck holder (10a), the latch plates of which are plug-in connected to one of the pairs of buckle assemblies (18a / 19a to 18n / 19n) of the seat backrest, to restrain shoulders and a neck of a belted child and the space thereof is exploited to accommodate legs of the child sitting on the rear portion thereof;  
30 where the safety child-seat can be converted back into the safety adult-seat.

Claim-51. (currently amended) ~~A restraint system~~ An energy-absorbing, vibration-dampening safety baby-cot according to claim 50, wherein the child-seat is transformed into a baby-cot when the seat backrest is flipped into a resting position;

the safety child-seat is transformed into a safety baby-cot when the seat backrest is flipped downwards;  
40 where the safety baby-cot can directly be converted back either into the safety child-seat or into the safety adult-seat.

Claim-52. (cancelled) ~~A restraint system, characterized by use of metal, compound material, glass fibre-reinforced material or non-metal material for material of the parts of the shoulder-restraint system, neck holder and set of energy absorbers.~~

5 | Claim 52. (new) The restraint system according to claim 46, wherein the lap buckle assembly (9.1) has a master release button (84),  
which is connected to release buttons of the remaining buckle assemblies of the seat belt and  
to release buttons of the pairs of buckle assemblies, to one of which the latch plates of the  
holder is plug-in connected, as well as to the release buttons of the anti-submarining  
buckle assemblies,  
where the master release button (84), when depressed, disengages the movable anti-  
submarining latch plate and all the latch plates of the holder and seat belt.